

## **EVERETT COSIO SALAS**

California Institute of Technology – Jet Propulsion Laboratory; 4800 Oak Grove Drive, Pasadena, CA 91109 Phone: 818-393-1512; everetts@caltech.edu

### **EDUCATION**

*Ph.D. Geological Sciences*

University of Southern California, Los Angeles, CA. 2008

*M.S. Molecular and Experimental Pathology*

University of Southern California, Los Angeles, CA. 2002

*B.S. Biology, with Minors in Chemistry and Political Science*

California State Polytechnic University Pomona, Pomona, CA. 1998

### **RESEARCH EXPERIENCE**

*Caltech Postdoctoral Scholar*

*California Institute of Technology – Jet Propulsion Laboratory, Pasadena, CA.*

*November 2010 - Present*

Assisting in the development of remote sensing equipment to be deployed on IODP Expedition 336: Mid-Atlantic Ridge Microbiology Expedition. Conducting research into the use of Deep UV native fluorescence and resonance Raman spectroscopy for investigating the microbial ecology and biogeochemistry of subsurface environments.

*Postdoctoral Research Associate*

*Rice University, Houston, TX. 2008-2010*

Investigated the interactions between microbes and nanomaterials. Part of a collaborative effort to increase the performance of microbial fuel cells. Investigated the relationship between the physical characteristics of surfaces and bacterial adhesion and biofilm formation.

*Research Collaborator*

*Jet Propulsion Laboratory, Pasadena, CA. 2003-2008*

Developed analysis software that allows for the differentiation of biologic and abiotic organic signatures collected on opaque surfaces using Deep UV native fluorescence.

*Graduate Research Fellow*

*University of Southern California, Los Angeles, CA. 2005-2008*

*Dissertation Work*

Investigated the mechanisms of iron reduction by various strains within *Shewanella*. Researched the relationship between iron oxide reduction rate and secondary iron mineral formation. Investigated the relationship between organic carbon source and reduced iron oxide mineral products.

*Graduate Research Assistant*

*University of Southern California, Keck School of Medicine, Los Angeles, CA. 2000-2002*

Researched the relation between vascular occlusion and recanalization, and the onset of Alzheimer's Disease. Quantified the relationship between a reduction in overall vessel size in cortical regions of the brain and the onset of Alzheimer's Disease.

*Undergraduate Work-study*

*California State Polytechnic University Pomona, Pomona, CA. 1998*

Investigations on the genetic regulatory mechanisms for cyp71A1 induction in avocado.

## PUBLICATIONS

Bhartia R, **Salas EC**, Hug WF, Reid RD, Lane AL, Edwards KJ, Nealson KH. "Label-free bacterial imaging with deep-UV-laser-induced native fluorescence." *Applied and Environmental Microbiology*. 76(21):7231-7237. November 2010

**Salas EC**, Sun Z, Lüttge A, Tour JM. "Reduction of graphene oxide via microbial respiration." *ACS Nano*. 4(8):4852-4856. August 2010

**Salas EC**, Berelson WM, Hammond DE, Kampf AR, Nealson KH. "The influence of bacterial strain specificity on secondary iron mineral formation." *Geochimica et Cosmochimica Acta*. 74. 574-583. January 2010

**Salas EC**, Berelson WM, Hammond DE, Kampf AR, Nealson KH. "The impact of carbon source on the products of dissimilatory iron reduction." *Geomicrobiology Journal*. 26(7):451-462. October 2009

Waters MS, **Salas EC**, Goodman SD, Nealson KH. "Early detection of oxidized surfaces using *Shewanella oneidensis* MR-1 as a tool." *Biofouling*. 25(2):163-172. February 2009

Bhartia R, Hug WF, **Salas EC**, Reid RD, Sijapati K, Tsapin A, Nealson KH, Lane AL, Conrad PG. "Native fluorescence spectroscopy: classification of organics with deep UV to UV excitation." *Applied Spectroscopy*. 62(10):1070-1077. October 2008

## NON-REFEREED PUBLICATIONS

Bhartia R, Hug WF, **Salas EC**, Sijapati K, Lane AL, Reid RD, Conrad PG. "Biochemical detection and identification false alarm rate dependence on wavelength using laser induced native fluorescence." *Proceedings SPIE*. 6218. 62180J. May 2006

## TEACHING EXPERIENCE

Rice University, Houston, TX, Fall 2010

Biogeochemistry (ESCI 203)

Co-taught course with Andreas Lüttge (Instructor of Record)

International GeoBiology Course

*Invited Lecturer*

University of Southern California, Los Angeles, CA, July 2010

University of Southern California, Los Angeles, CA. 2002-2006

Humans and Their Environment, Lab (BISC 102L, undergraduate level)

Introduction to Oceanography, Lab (GEOL 107L, undergraduate level)

## INVITED TALKS

Colorado School of Mines, Environmental Science and Engineering Division. October 2009

Geological Society of America. Abstracts with Programs. 40:6. p456. Paper 295-2. Houston, TX. October 2008

University of Southern California, Viterbi School of Engineering. Department of Environmental and Civil Engineering Speaker Series. Fall 2007

## PRESENTATIONS

**Salas EC**, Lüttge A, Arvidson RS, Fischer, C. "Quantitative studies on the relationship between surface roughness and bacterial adhesion." Goldschmidt Conference. June 2010.

**Salas EC**, Lüttge A, Arvidson RS. "Multiscale imaging of cells on solid surfaces using vertical scanning interferometry." Gordon Research Conference. July 2009

**Salas EC**, Bhartia R, Hug WF, Nealson KH. "The identification of microbes on solid substrates using deep UV native fluorescence." 109<sup>th</sup> General Meeting of the American Society for Microbiology. May 2009

**Salas EC**, Berelson WM, Lund SP, Nealson KH. "The effect of organic carbon species on the biomineral products of dissimilatory iron reduction." 33<sup>rd</sup> International Geological Congress. August 2008

**Salas EC**, Berelson WM, Nealson KH. "The influence of organic carbon species on dissimilatory iron reduction." 108<sup>th</sup> General Meeting of the American Society for Microbiology. May 2008

**Salas EC**, Kukkadapu RK, Fredrickson JK, Nealson KH. "Secondary iron mineral formation by *Shewanellae* using different carbon sources." American Geophysical Union, Fall Meeting. December 2007

**Salas EC**, Bhartia R, Conrad PG. "An experiment for comparison of multivariate statistical techniques for increasing spectral separation of organic chemical biosignature data." International Journal of Astrobiology, Supplement. p113. April 2004

## **FELLOWSHIPS, AWARDS AND GRANTS**

Senior Participant, NASA ASTID: *Mojave Subsurface Biogeochemistry Explorer (MOSBE)*. This project aims to examine the microbial biomass and diversity within subsurface arid environments and place them within a lithologic context to better understand their potential as ecologic niches on, and in, Mars. (E.C. Salas, Co-author, L. Beegle, PI; R. Bhartia, W. Abbey, Co-Is). 2011-2016. Pending

Senior Participant, Sloan Foundation: *Dark Energy Biosphere Investigation Tool (DEBI-T)*. This project will develop instrumentation able to characterize the distribution of microbial communities beneath the sea floor without the need for sample processing or tagging. (W.H. Hug, PI; K.J. Edwards, R. Bhartia, Co-Is). 2010-2012

National Institutes of Allergy and Infectious Diseases Underrepresented Minority Travel Grant for the 109<sup>th</sup> and 110<sup>th</sup> ASM General Meetings. 2009 and 2010

Graduate Fellowship

NIH Center of Excellence in Genomic Sciences Minority Action Program (CEGS MAP) University of Southern California. Winter 2007 – Fall 2008

Total of \$15,000 awarded by USC in support of various outreach activities aimed at increasing the number of underrepresented minorities pursuing careers in STEM fields. 2006-2008

USC Department of Earth Sciences Graduate Student Award for Excellence in Teaching. Spring 2006

## **SERVICE ACTIVITIES**

"Geobiology: Solving the world's problems through interdisciplinary research." Seminar directed towards undergraduate and early graduate students at the SACNAS National Conference. Anaheim, CA. October 2010.

Seminar for undergraduates and early graduate students on graduate and postdoctoral opportunities in science. Rice University Alliances for Graduate Education and the Professoriate (AGEP). June 2010

Planning Committee for the 2010 Society for the Advancement of Chicanos and Native Americans in Science (SACNAS) National Conference. Anaheim, CA.

“Geobiology: Opportunities at the horizon between life and the Earth.” Seminar directed towards undergraduate and early graduate students at the SACNAS National Conference. Dallas, TX. October 2009

Panel discussion on finding a postdoctoral position. University of Houston Alliances for Graduate Education and the Professoriate (AGEP). October 2009

Seminar for undergraduates and early graduate students on graduate and postdoctoral opportunities in science. Rice University Alliances for Graduate Education and the Professoriate (AGEP). July 2009

“Geobiology: Interdisciplinary tools for understanding life's response to climate change through time.” Seminar directed towards undergraduate and early graduate students at the SACNAS National Conference. Salt Lake City, UT. October 2008

Co-chair for the 5<sup>th</sup> Annual Southern California Geobiology Symposium. University of Southern California. April 12<sup>th</sup>, 2008

Mentor for the Animo Inglewood Charter High School Leadership Weekend. Wrigley Institute for Environmental Studies, Catalina Island. April 2008

Science Judge for the 2008 National Ocean Sciences Bowl, Los Angeles Surf Bowl Regional Championship.

“Geobiology: An emerging field in the Earth and life sciences.” Seminar directed towards undergraduate and early graduate students at the SACNAS National Conference. Kansas City, MO. October 2007

## **PROFESSIONAL ORGANIZATIONS**

American Geophysical Union(AGU)

American Society for Microbiology(ASM)

International Society for Microbial Ecology (ISME)

Mineralogical Society of America(MSA)

Society for the Advancement of Chicanos and Native Americans in Science (SACNAS)

## **ADDITIONAL PROFESSIONAL DEVELOPMENT**

Preparing for an Academic Career in the Geosciences Workshop. July 29<sup>th</sup>-August 1<sup>st</sup>, 2010

USC/Agouron International GeoBiology Course. 2006

University of Hawaii/NAI Astrobiology Winter School. 2005

NASA Planetary Science Summer School. 2003

## REFERENCES

Dr. Luther W. Beegle

Group Supervisor, Instrument Development and Spectroscopy Research Element  
Planetary Chemistry and Astrobiology

California Institute of Technology – Jet Propulsion Laboratory

4800 Oak Grove Drive, MS 183-601

Pasadena, CA 91109

(818) 642-8913

[luther.beegle@jpl.nasa.gov](mailto:luther.beegle@jpl.nasa.gov)

Dr. Andreas Lüttge

Professor, Departments of Earth Science and Chemistry

Rice University

6100 Main Street, MS 126

Houston, Texas 77005

(713) 348-6304

[aluttge@rice.edu](mailto:aluttge@rice.edu)

Dr. James M. Tour

T.T and W. F. Chao Professor of Chemistry

Professor, Departments of Computer Science, Mechanical Engineering and Materials Science

Rice University

Smalley Institute for Nanoscale Science and Technology

6100 Main Street, MS 60

Houston, Texas 77005

(713) 348-6246

[tour@rice.edu](mailto:tour@rice.edu)

Dr. Kenneth H. Nealson (Doctoral Thesis Chair)

Wrigley Chair in Environmental Studies

Professor, Departments of Earth Sciences and Biological Sciences

University of Southern California

3651 Trousdale Pkwy, MC 0740

Los Angeles, CA 90089

(213) 821-2271

[knealson@usc.edu](mailto:knealson@usc.edu)

Dr. William M. Berelson

Professor, Department of Earth Sciences

University of Southern California

3651 Trousdale Pkwy, MC 0740

Los Angeles, CA 90089

(213) 740-5828

[berelson@usc.edu](mailto:berelson@usc.edu)